Date=23/07/2020
Lecture By=Shubham Joshi
Subject ⇒ Binary Search

IN PREVIOUS LECTURE **(QUICK RECAP) Date-22/07/2020**	**In Today's Lecture (Overview)**
What is Palindrome **Fibonacci Series/Problem** **Matrix Problem** **Important Things**	**⇒ How to print all Subsequence of String** **==>New Topic** **⇒ Binary Search** **MCQs For Practice**

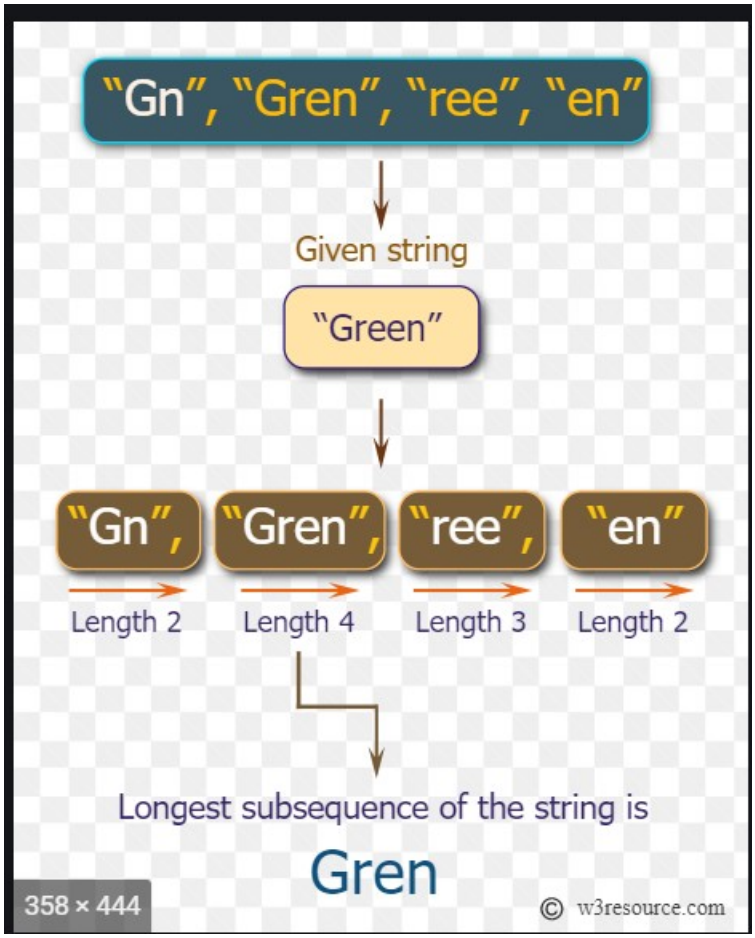
⇒ How to print all Subsequence of String

Definition-

A **subsequence** is a sequence generated from a **string** after deleting some characters of **string** without changing the order of remaining **string** characters

Steps To print All subsequences

Step 1: **Iterate** over the entire String
Step 2: Iterate from the **end of string in order to generate different substring** add the substring to the list
Step 3: **Drop character from the substring obtained from above** to generate different subsequence.
Step 4: if the subsequence is not in the list then recur.



*This Image Is Just Example

Program/Code

```
def F(str, idx, res):

    if idx == len(str):
        print(res)
        return
    F(str, idx + 1, res) #skipping the character
    F(str, idx + 1, res + str[idx]) # taking the character

if __name__ == '__main__':
    F("ABC", 0, "")
```

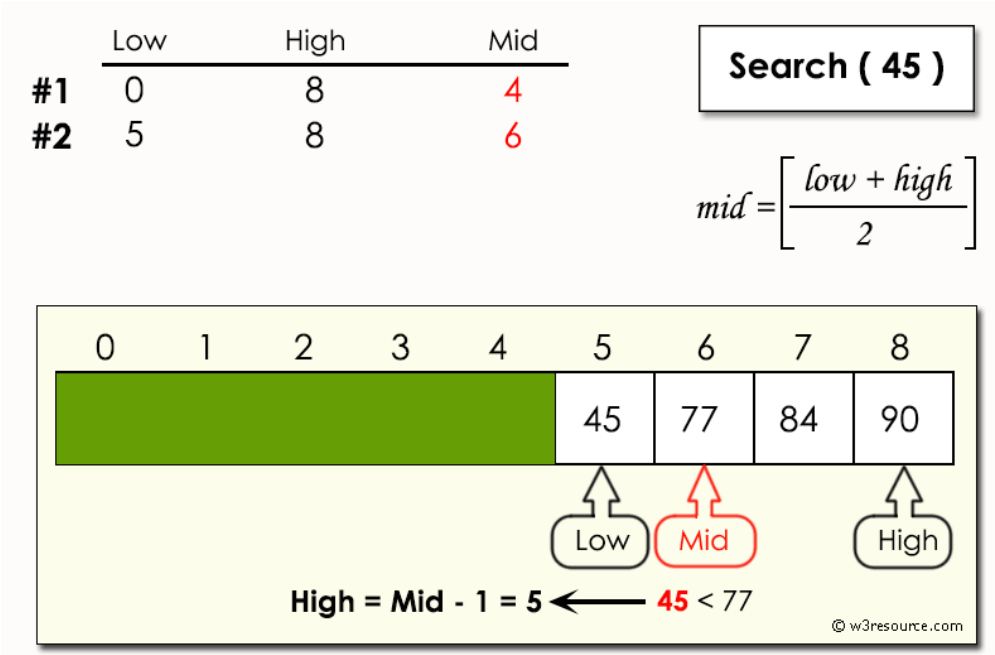
==>New Topic

⇒ Binary Search

Definition-

-In Python a **binary search** algorithm **finds the position of a target value** within a sorted array.

-The **binary search** algorithm can be classified as a **divide-and-conquer search** algorithm and executes in logarithmic time.



Algorithm of binary Search\Rules
-Requires **Array[]**
-Requires **Target** Element

Code Of Binary Search

```
def binarySearchWithRecurssion(list, target, l, r):
    if l > r:
        return False
    mid = (l + r) // 2
    if list[mid] == target:
        return True

    if list[mid] > target:
        binarySearchWithRecurssion(list, target, l, mid - 1)
    elif list[mid] < target:
        binarySearchWithRecurssion(list, target, mid + 1, r)
    return False

if __name__ == '__main__':
    l  = [1,2,3,4,5]
    print(binarySearchWithRecurssion(l, 33, 0, len(l) - 1))
```

*This Program Search's 33 in The 1

MCQs For Practice

1.What is the time complexity of linear searching ?

(A)= O(logn)

(B)= O(n)

(C)= O(n2)

2.What is the time complexity of Binary Search ?

(A) = log(N)

(B)= O(N)

(C)= worst cast O(N) best case Log(N)

3.Which of the following is correct about binary search ?

(A)= it reduces the search base by dividing it to 2

(B)= it is faster than linear search

(C)= it reduces the search base by dividing it to 3

4.which of these is not a subsequence of ABC?

(A)= CB

(B)= BC

(C)= AB

(D)= ABC

Answers Of The MCQs

1. B

2. A

3. A or B

4. A